SUMMARY
The present study concerning the occurrence of diseases on betelvine cultivars and their management was carried out at Mahoba during 1981-87. It deals with the intensity of damage caused to the plantations due to various diseases during 1982-84, symptoms of the individual diseases, effective control measures evolved to contain the diseases etc. The final recommendations include prophylactic measures that will ensure freedom from disease and/or minimise the loss due to diseases.

Foot and leaf rot (Phytophthora parasitica var. piperina Dastur), collar rot (Sclerotium rolfsii Sacc.), anthracnose (Colletotrichum capsici (Syd.) Butler and Bisby) and leaf spot, blight and stem canker caused by Xanthomonas campestris pv. betelicola Dye. are the key diseases that cause extensive damage to the betelvine crop. The losses in yield were due to the cumulative effect of different diseases causing damage to the leaves and mortality of vines.

Amongst less important diseases, marginal necrosis (Nigrospora sphaerica (Sacc.) Mason) ranked first. Powdery mildew (Oidium piperis Uppal, Kamat and Patel), charcoal rot (Bipolaris spicifera (Bainier) Subram ), stem tearing (Fusarium lateritium, Nees), leaf mosaic (Poty virus group) although were moderate or minor in terms of losses caused
to the crop during the period of survey, may develop into serious proportion in proper prophylactic and control measures are not initiated.

Leaf spots caused by *Alternaria alternata* (Fr.) Keissler and *Curvularia lunata* (Wakker) Boedijn; physiological disorders such as tip burn and frost injury were of minor importance in the area. It is clearly evident that the incidence and severity of diseases varied from year to year; it being most severe during 1982, when Mahoba received almost twice the quantity of normal rains.

Observations on field susceptibility to diseases of the five cultivars showed that cv. Kapoori was tolerant to foot and collar rot as well as leaf spot diseases viz. anthracnose and bacterial. Cvs. Bangla and sanchi were moderately tolerant to anthracnose, and foot and leaf rot. Cvs. Meetha and Desawari were most susceptible to almost all key diseases. Studies on the perpetuation and spread of the diseases indicated that pathogens such as *Phytophthora parasitica* var. *piperina* and *Xanthomonas campestris* pv. *betlicola* are plantborne and the planting material viz. cuttings play a positive and primary role in initiating the diseases in the new plantations.

Effect of pretreatment of planting setts with chemicals showed that combined treatment of setts with Blitox 0.25% and streptocycline
at 500 ppm for 20-30 minutes was most effective (70.36% disease control) in reducing the mortality of vines due to foot rot.

During the periodic surveys carried out all the year round, no intercrop was found infected with the betelvine pathogen.

Scanning electron microscopy studies on the mechanism of infection in foot and leaf rot disease indicated that the pathogen, Phytophthora parasitica var. piperina makes entry into the host (leaves) through the stomata. Formation of infection cushion and appresorium was noticed. The infection cushion penetrates primarily after forming penetration pegs which form the appresorium which in turn makes entry into the tissue by mechanical pressure.

In vitro trials showed that 'Kapoori' oil exhibited minimum inhibitory concentration MIC of 250 ppm against Sclerotium rolfsii. The toxicity index values showed that kapoori oil was most potent (445/500) and amongst its constituents eugenol was highly potent (460/560). The essential oil of Ocimum gratissimum proved an effective fungitoxicant against betelvine diseases.

Field trials using different fungicides and antibiotics have shown that application of Blitox 0.25% (Copper oxychloride 50WP) at
15-20 days interval was most effective against mortality due to foot and leaf rot and Blitox at 0.25% with streptocycline at 500 ppm was best against leaf spots caused by Xanthomonas campestris pv. betelicola and Colletotrichum capsici (Syd.) Butler and Bisby.

Trials in cultivators' plantations to demonstrate the efficacy of disease management showed that the cost of pest and disease control operations ranged between Rs. 16.63 and Rs. 18.64 per row (50 m²) per year during 1982-84. The average avoidable yield losses ranged between 2.17 - 3.60 kg. per row during the three years of experiment. The cost-benefit ratio of disease control operations was 1:4.6, 1:6.62 and 1:8.17 during 1981, 1982 and 1983 respectively.

The results of trial using differential application of nitrogen, phosphorus and potassium, emphasized the need for balanced nutrition in order to minimise the loss due to diseases. Under the conditions of experiment an annual application of 150 kg N, 100 kg each of P and K in judicious proportion of inorganic and organic form and in appropriate split doses ensured balanced nutrition of betelvines.

The survey of betelvine plantations in Mahoba for foliar analysis indicated that the vines with high leaf nitrogen (>3%) were prone
to diseases. The leaf K of healthy plantations showed a potassium values of 1.93%. It was also of interest to know that high disease incidence noticed in some of the plantations was due to unusually high rate of nitrogen fertilization practiced.

It is evident from the present study that well planned schedule of prophylactic and therapeutic measures against diseases and a balanced nutrition lead to increased yield and better quality leaves.